



**MANIPAL INSTITUTE OF TECHNOLOGY**

**MANIPAL**

*(A constituent unit of MAHE, Manipal)*

**DEPARTMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY**

**V SEMESTER B.TECH. (INFORMATION TECHNOLOGY)**

**END SEM EXAMINATIONS, DECEMBER 2021**

**SUBJECT: SOFTWARE ENGINEERING [ICT 3159]**

**REVISED CREDIT SYSTEM**

**(30/12/2021)**

**(Date: 30-12-2021 Time: 2:20 PM – 3:35 PM)**

**Time: 75 Minutes**

**PART-B**

**MAX. MARKS: 20**

**Instructions to Candidates:**

- ❖ Answer **ALL** the questions.
- ❖ Missing data if any may be suitably assumed.

Q. No	Question	M	CLO	AHEP4 LO	BL
1A	<p>Identify suitable actors, use cases and relationship, and draw the use-case diagram for the following scenario. Write use case specifications for any one use-case.</p> <p>Consider how an insurance company's system handles claims. When a claim is submitted by a customer through e-mail, the system stores the customer's claim information and automatically sends a reply mail notifying the same. A claim specialist logs onto the system and checks for new claims from customers. He views customer's claim history if needed. He then decides reimbursements and updates the claim information to mark the claim as processed. The system maintains the information about the specialist handling a particular claim. At the end of the day the system administrator logs in. he is given the option to view all information stored in the system. He may then ask the system to generate mails to all customers whose claims have been processed. The customers can log into the system and dispute reimbursement amount. The claim specialist can view these disputes and update claim status if need be. A corresponding mail, mentioning if reimbursement has been updated/remains same, is also generated, and sent to the customer. Note that, a claim specialist is a person who investigates details of claims and decides the reimbursement based on customer's claims history.</p>	5	2	5	4
1B	<p>Draw the sequence diagram for use-case scenario "Create New Library User Account" by identifying appropriate synchronous and asynchronous messages, object creation and deletion and fragments.</p>	3	2	1	3



1C	<p>A company has decided to approximate the cost of their ERP software project using function oriented metrics. They have 24 External Inputs with Simple complexity, 15 External Outputs with high complexity, 19 External inquiries with average complexity, 22 internal files and 20 external interfaces both with high complexity. Using complexity adjustment factor as 1.08 and the below table for weighting factors, compute the function point for the project. If the language factor for Java is 38, what are the total Source Lines of Code in this ERP?</p> <table><tr><th>Function Units</th><th>Simple</th><th>Average</th><th>High</th></tr><tr><td>External Inputs</td><td>3</td><td>4</td><td>6</td></tr><tr><td>External Outputs</td><td>4</td><td>5</td><td>7</td></tr><tr><td>External Inquiries</td><td>3</td><td>4</td><td>6</td></tr><tr><td>Internal Files</td><td>7</td><td>10</td><td>15</td></tr><tr><td>External Interfaces</td><td>5</td><td>7</td><td>10</td></tr></table>	Function Units	Simple	Average	High	External Inputs	3	4	6	External Outputs	4	5	7	External Inquiries	3	4	6	Internal Files	7	10	15	External Interfaces	5	7	10	2	5	2	3
Function Units	Simple	Average	High																										
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2A	<p>Identify the classes using noun phrase approach and draw the class diagrams with appropriate relationships, multiplicities etc.</p> <p>Customer can browse through the product catalog and add the items to shopping cart. He can proceed to checkout as long as his shopping cart is not empty. Customer will require to login to the system when he proceed to checkout, or he can create an account if he not yet has one. The order will charge to the credit card registered in customer's account. Customer need to provides full name, email address, phone number, credit card and billing address details when creating an account. Customer can login to the system to maintain his account information, such as changing phone number, address, and credit card details, and check the status of his orders. On receiving the order, the sales staff will process the order by charging to customer's credit card. Once the order has been charged, he will then mark the order as paid and pass to Courier Company and deliver them to customer. If the items ordered by the customer are out of stock, then the order will mark as on hold. Once the item(s) arrive, the order will be passed to Courier Company for delivery. Courier Company will pack the item with standard packaging, but if the order is marked as gift, then the items will be gift packed. If the items are damaged on arrival, the customer can return it by registering in the online shop. Courier Company will collect the item from customer and sales staff will refund the money for that item. Marketing staff is responsible to maintain the product catalog. He can also setup the promotion item list and send promotion email to customer.</p>	5	2	5	4																								
2B	<p>You are the Project Manager of a company and you have been asked to estimate the time required for the completion of the project WinSolutions.</p>	3	5	9	3																								



Your subordinates have come up with the estimates of the tasks that are a part of Winsolutions as follows:

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	C,F, J	E	-	B,H	C,J	-	A,I	J	E, F	-	B, H,I
Time (Days)	7	6	9	7	3	8	4	9	9	7	5

Construct an activity network for WinSolutions and find the critical path in the network. Also compute the slack time for each of the activities.

**2C**

Draw the Swinlane diagram for following scenario by identifying appropriate conditions along with forks & joins.

Consider a banking system. The bank manager can log into the system to add and delete customer accounts. In addition, he can modify customer details. The cashier logs onto the system and can update balance details when the customer withdraws/deposits an amount from his account. When an account is closed an e-mail to the customer is generated and sent automatically. The customer can log onto the system and lodge complaints if any. In addition, he can check his account balance. The complaints from the customer are viewed by the manager and the status of the complaint is maintained by the system. The complaints are handled manually, and the manager updates the complaint status in the system once processing is done. An e-mail to the customer is again automatically generated and sent notifying the status of his complaint.

**2**

**2**

**5**

**3**